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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/428,468	10/28/1999	SAID O. BELHAJ	BELHAJ5	4691

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FARKAS & MANELLI PLLC
2000 M STREET NW
7TH FLOOR
WASHINGTON, DC 200363307

EXAMINER

SPENCER, WILLIAM C

ART UNIT PAPER NUMBER

2675

DATE MAILED: 11/28/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

T.R

Office Action Summary

Application No.

09/428,468

Applicant(s)

BELHAJ, SAID O.

Examiner

William C. Spencer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 1999 through 4 April 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-7 and 9-20 is/are rejected.
- 7) ☒ Claim(s) 3 and 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 May 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: In p. 3, line 27, the word "of" is omitted between "plurality" and "row." In p. 3, line 30, "the" is capitalized in mid-sentence. In p. 4, line 15, there is a period instead of a comma. In p. 7, line 19, "Col." is spelled "Co." In p. 14, line 24, there is an added period; in line 26, "AC" is spelled "Ac." In p. 16, line 14, "both" is spelled "bot."

Between p. 16, line 8, and p. 19, line 10, there are numerous examples of the term "FOR/REV" with a box around the "FOR" part. This does not match the term "FOR/REV" used in the drawings. As the examiner is unsure if the box can be printed if the patent is issued, and an overlying bar is conventionally used to indicate inversion, changing the text is preferred. Regarding the mismatch, refer also to 37 CFR 1.84(p)(5).

Appropriate correction is required. Due to the large number of informalities, Applicant's further proofreading is also advised.

Claim Objections

2. Claim 9 is objected to because of the following informalities: In line 2, the word "of" is omitted between "plurality" and "row." Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. Claims 16-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 16 refers twice to “predetermined voltage level” (lines 3 and 8) followed by “said predetermined voltage level” (in lines 5-6 and 10-11). It is unclear if these levels are the same or different (they are applied to different conductors). In the dependent claims, it is unclear which “predetermined voltage level” is referred to by “said predetermined voltage level.”

5. While applicant may be his or her own lexicographer, a term in a claim may not be given a meaning repugnant to the usual meaning of that term. See *In re Hill*, 161 F.2d 367, 73 USPQ 482 (CCPA 1947). The term “switch” in claims 7, 12, 13, 15, 19, and 20 are (presumably) used by the claim to mean a persistent type of switch (see p. 3, line 3 of the disclosure) while the accepted meaning is any kind of switch. As the *lack* of a modifying term appears to be used to modify the term “switch,” the claims are confusing. These claims are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Further, claim 7 either fails to further limit the parent claim or is redundant to claim 6.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Valdenaire, U.S. Patent no. 5,677,687.

As to claim 1, FIG. 1 of Valdenaire discloses a prior art switching matrix with five rows R1-R5 and five columns C1-C5. The part of the figure on the left shows the rows being driven and the columns being read from. The part of the figure on the right shows the columns being driven and the rows being read from.

As to claim 2, Valdenaire's description of FIG. 1 in col. 1, lines 16-25 makes it clear that the thick "T" shapes of lines in the figure, similar to the art-recognized symbol for a pushbutton, and located at each intersection of a row and column, are key switches. Key "K" is described in lines 24-25 to be the intersection of row 2 and column 3, and the key symbol at that location is circled in the figure.

8. Claims 9 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Fuldner et al., European Patent no. 0441129.

As to claims Fuldner discloses a switch matrix comprising sub-matrices T1 and T2, with columns S1-S4 (with Sn showing expandability) and rows R1-Rm. The circles T111-T2m4 around the matrix intersections are commonly used in the art to indicate the individual switches of a switch matrix; the matrix would have no purpose without them. Sub-matrices T1 and T2 each have a number of switches equal to the number of rows times the number of columns, and the total number of switches is twice the number of rows times the number of columns.

It could be argued that the actual rows of the matrix are R11-R1m plus R21-R2m. In view of the instant disclosure, and others, the main point of interest is the number of lines

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connected to active circuitry, and diodes and wiring may be considered part of the switching matrix. Even lacking translation, it appears that Fuldner also considers this to be the case ("Tastatur auf 2 (m x n) verdoppelt," section 2.2, line 2). Active circuitry would require power connections, while a keyboard assembly in accordance with Fuldner would only require m x n connections; while today's miniature circuitry may not result in a preference for a simple diode over an active component, this is a recent development.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Valdenaire.

Refer to above discussion of claims 1 and 2.

As to claims 4 and 5, it is well known in the art that the keys of an electronic keyboard are usually temporary connection pushbutton switches.

As to claims 6 and 7, it would have been obvious to one skilled in the art at the time of the invention that other types of switches can be scanned by a switch matrix, providing the operator knows not to connect too many switches at a time. The advantage is the same as with pushbuttons.

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11. Claims 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuldner.

Refer to above discussion of claims 9 and 10.

As to claim 11, it is well known in the art that the keys of an electronic keyboard are usually temporary connection pushbutton switches.

As to claims 12-15, it would have been obvious to one skilled in the art at the time of the invention that other types of switches can be scanned by a switch matrix, providing the operator knows not to connect too many switches at a time. The advantage is the same as with pushbuttons.

Allowable Subject Matter

12. Claims 3 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. Claims 16-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sasaki, Japanese Patent publication JP356027438A, discloses a switch matrix where the total number of switches is twice the number of rows times the number of columns.

Sakashita et al., U.S. Patent no. 4,138,917, Renschke, U.S. Patent no. 4,266,213, Bauer, U.S.

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Patent no. 4,673,933, and Bower, U.S. Patent no. 4,918,445 disclose switch matrices where both the rows and columns are driven.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Spencer whose telephone number is 703-306-5842.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Saras can be reached on 703-305-9720.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

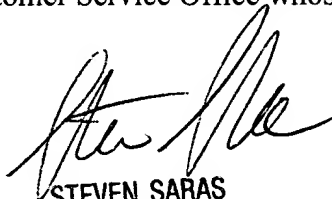
Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.


STEVEN SARAS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600